Chapter Two: Inventory

INTRODUCTION

This chapter presents an inventory of aviation facilities at airports included in the Vermont Airport System and Policy Plan. The Vermont Airport System is comprised of 17 public-use facilities. There are also private-use aviation facilities in Vermont, but they are not included in the Airport System and Policy Plan because they are not open to public use. The public-use airports in Vermont range in size from small, single-runway facilities to larger, international airports. Primary factors determining the adequacy of Vermont's public-use airports are the facilities and services that each airport provides its users. Therefore, it is important to determine the physical attributes and services available at each airport.

This chapter of the Vermont Airport System Plan documents a general overview of existing facilities at each airport included in the State's system of public use airports. This information is provided primarily in the form of tables that present the information in a logical form for later use in the analysis.

STUDY AIRPORTS

As previously stated, Vermont's public-use airport system is comprised of 17 facilities. Vermont's Airport System is unique when compared to other states because 10 of the State's public-use airports are owned and operated by the Vermont Agency of Transportation (VTrans). Municipalities own two system airports and the remaining five are owned by private parties.

The system plan airports are:

- Basin Harbor
- Burlington International
- Caledonia County State
- Edward F. Knapp State
- Fair Haven Municipal
- Franklin County State
- Hartness State (Springfield)
- John H. Boylan State (Island Pond)
- Middlebury State
- Morrisville-Stowe State
- Mount Snow
- Newport State
- Post Mills
- Rutland State
- Shelburne
- Warren-Sugarbush
- William H. Morse State

Exhibit 2-1 presents the location of system plan airports and identifies the ownership type of each.

Vermont Airport System Plan
Public-Use Airport Location and Ownership

Exhibit 2-1

INVENTORY PROCESS

A variety of sources provide a wealth of data regarding the airports in Vermont's Airport System. Key data gathered in the inventory includes both airside and landside facilities, types of available approaches, based aircraft, and annual airport operations. This data provides the framework for analyzing the performance of the existing airport system relative to the goals and objectives developed for the system plan and summarized in Chapter One.

Relevant data for the system plan's inventory process was compiled from the following sources:

- Vermont Airports Directory
- VTrans Airport Information Management System (AIMS)
- Airport Facility Directory
- U.S. Terminal Procedures
- FAA 5010 Airport Master Record

The initial step of the inventory effort included compiling all available data for each system airport. Once the data was compiled, discrepancies in the various data sources were reviewed with VTrans staff to identify the most recent, valid, and correct data for each airport. The types of data discrepancies addressed in this process included verifying correct runway dimensions, current pavement conditions, and other specific data that is important to the system performance analysis.

AVIATION FACILITIES

To facilitate the presentation of data, airport inventory information has been compiled into tables that summarize the following general categories of airport data:

- Airport Overview
- Airside Facilities
- Airport Navigational Aids and Lighting
- Airport Landside Facilities

The following sections summarize the inventory of existing facilities at Vermont's public-use airports.

AIRPORT OVERVIEW

Table 2-1 presents the following data for each system airport:

- The associated city of each system airport
- Each airport's three letter/digit airport identifier at the time of the preparation of this document
- The current ownership, identified as public or private, of each public-use airport
- The current level of service of each airport. **Exhibit 2-2** also shows each airport and its current service classification, either commercial (CS) or general aviation (GA). Burlington International and Rutland State are the only airports in Vermont's system that are classified as commercial service. The remaining 15 airports are considered general aviation facilities[1].
- Airports currently included in the National Plan of Integrated Airport Systems (NPIAS), and for those included in the NPIAS, the airport's current NPIAS classification which is either Commercial Service or General Aviation

At the national level, the NPIAS identifies airports that are significant to the national air transportation system. The NPIAS is developed every two years by the FAA and presented to Congress to provide a five-year estimate of Airport Improvement Program (AIP) eligible development at NPIAS airports. The NPIAS is used by the FAA in managing and administering the Airport Improvement Program and supports the FAA's strategic goals for safety, system efficiency, and environmental compatibility by identifying the airport improvements that will contribute to achievement of those goals. Airports included in the NPIAS are classified as having a specific role within the national system. Thirteen of the State's 17 airports are in the NPIAS. These airports and their associated NPIAS role are graphically depicted in **Exhibit 2-3**.

[1] While Rutland State does have commercial airline service, the FAA's NPIAS classifies the airport as general aviation due to its passenger activity levels.

Table 2-1
Airport Overview

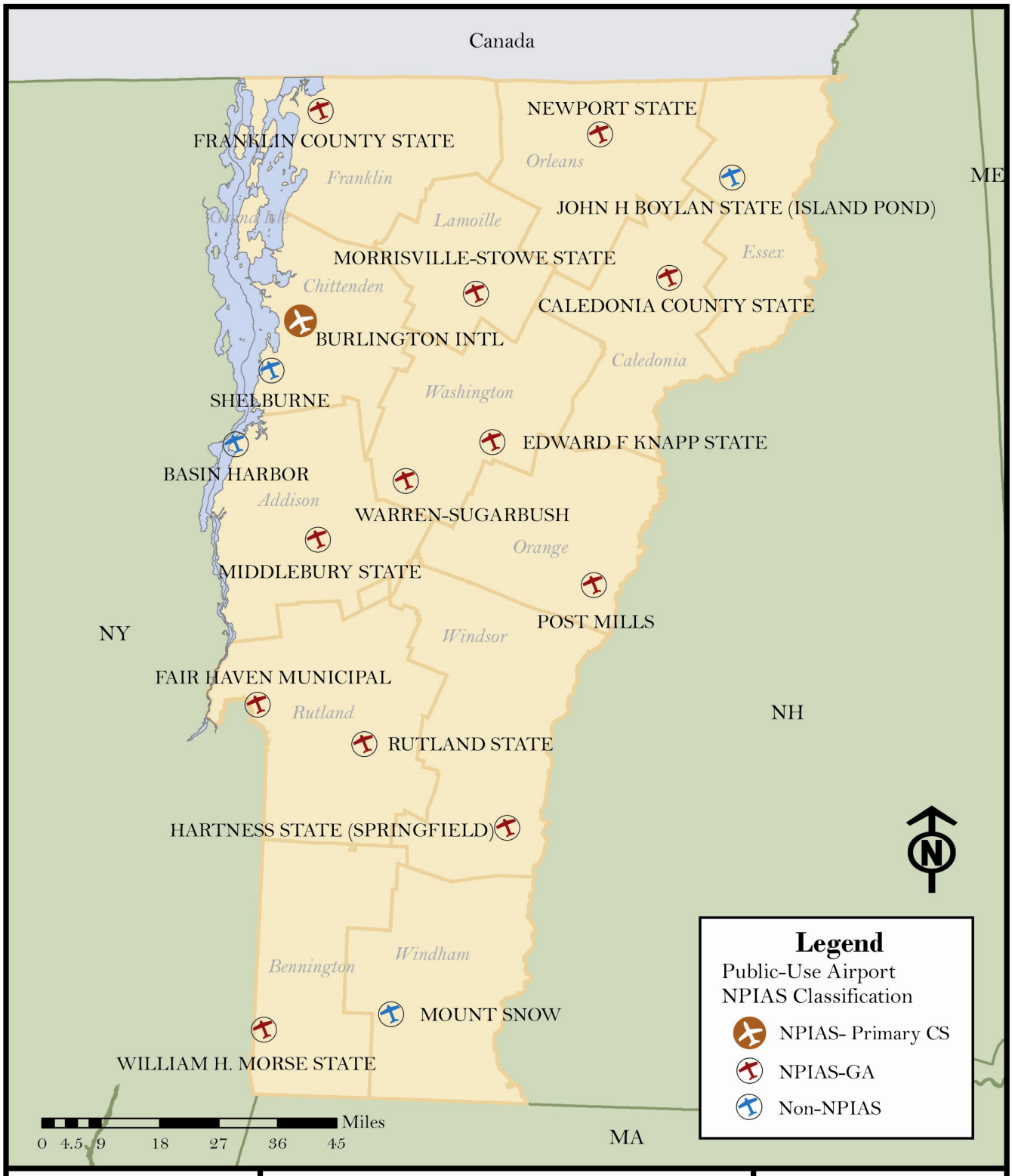
Airport Name	City	Airport Identifier	Ownership	Level of Service	NPIAS
Basin Harbor	Vergennes	B06	Private	GA	---
Burlington International	Burlington	BTV	Public (City of Burlington)	CS	Primary CS
Caledonia County State	Lyndonville	6B8	Public (VTrans)	GA	GA
Edward F. Knapp State	Barre/Montpelier	MPV	Public (VTrans)	GA	GA
Fair Haven Municipal	Fair Haven	1B3	Public (Town of Fair Haven)	GA	GA
Franklin County State	Highgate	FSO	Public (VTrans)	GA	GA
Hartness State	Springfield	VSF	Public (VTrans)	GA	GA
John H. Boylan State	Island Pond	5B1	Public (VTrans)	GA	---
Middlebury State	Middlebury	6B0	Public (VTrans)	GA	GA
Morrisville-Stowe State	Morrisville	MVL	Public (VTrans)	GA	GA
Mount Snow	West Dover	4V8	Private	GA	---
Newport State	Newport	EFK	Public (VTrans)	GA	GA
Post Mills	Post Mills	2B9	Private	GA	GA
Rutland State	Rutland	RUT	Public (VTrans)	CS	GA
Shelburne	Shelburne	VT8	Private	GA	---
Warren-Sugarbush	Warren	0B7	Private	GA	GA
William H. Morse State	Bennington	DDH	Public (VTrans)	GA	GA

Source: Wilbur Smith Associates

Vermont Airport System Plan

Public-Use Airport Service Classification

Exhibit 2-2



Vermont Airport System Plan

Airport Service Classification

Exhibit 2-3

AIRSIDE FACILITIES

Table 2-2 summarizes the airside facilities at each airport including runway designation, length, width, and surface type. Runways range in length from 1,950 feet at Fair Haven to 8,320 feet at Burlington International, the longest runway in Vermont's Airport System. The runways at most system airports are constructed of asphalt. There are several comprised of turf and one runway, at Fair Haven Municipal, is gravel.

In addition to the types of airside facilities at each airport, Table 2-2 includes information regarding the condition and strength of the runways. The FAA 5010 Airport Master Record reports runways being in the condition of either good (G), fair (F), or poor (P)[2]. Approximately three-fourths of the runways at public-use airports in Vermont are classified as being in good condition. The strength of a runway represents the amount of weight it can sustain based on different landing gear wheel-configurations. The strength of a runway is shown as a letter, representing the wheel-configuration; followed by a number expressed in thousands of pounds. Runway 15/33 at Burlington International, the longest runway in the State, is also the strongest in the State and is constructed of concrete. Runway 15/33 is able to accommodate aircraft weighing up to 355,000 pounds with dual-tandem (DT) landing gear, and 175,000 pounds for aircraft with dual-wheel (D) landing gear. Warren-Sugarbush has the weakest paved runway, and can only accommodate aircraft weighing 8,500 pounds or less with a single-wheel (S) configuration.

[2] "G" = Good Condition: 70-80% of the pavement may have some functional cracking that is properly sealed.
"F" = Fair Condition: 60-70% of the pavement may have functional cracking (unsealed joints& spalling).
"P" = Poor Condition: 50% or more of the pavement suffers from some form of structural distress (large open cracks, surface & slab spalling, vegetation through cracks and joints).

Table 2-2
Airside Facilities

Airport Name	City	Runway	Length	Width	Surface	Condition/PCI	Strength
Basin Harbor	Vergennes	2/20	3,000	90	Turf	Good	N/A
Burlington International	Burlington	1/19	3,611	75	Asphalt	Good	S-30, D-40, DT-60
		15/33	8,320	150	Asphalt-Grooved	Good	S-100, D-175, DT-355
Caledonia County State	Lyndonville	2/20	3,300	60	Asphalt	Good	S-12.5
Edward F. Knapp State	Barre/Montpelier	5/23	4,022	100	Asphalt	Good	S-30, D-46
		17/35	5,002	100	Asphalt	Fair	S-31, D-70
Fair Haven Municipal	Fair Haven	2/20	1,950	20	Gravel	Good	N/A
Franklin County State	Highgate	1/19	3,000	60	Asphalt	Good	S-12.5
Hartness State	Springfield	5/23	5,498	100	Asphalt	Fair	S-32, D-45
		11/29	3,000	75	Asphalt	Good	S-30
John H. Boylan State	Island Pond	14/32	2,650	120	Turf	Good	N/A
Middlebury State	Middlebury	1/19	2,500	50	Asphalt	Good	S-12.5
Morrisville-Stowe State	Morrisville	1/19	3,701	75	Asphalt	Fair	S-25
Mount Snow	West Dover	1/19	2,650	75	Asphalt	Fair	
Newport State	Newport	5/23	4,000	100	Asphalt	Fair	S-30, D-44
		18/36	4,000	100	Asphalt	Good	S-30, D-44
Post Mills	Post Mills	4/22	2,900	80	Turf	Good	N/A
		5/23	2,300	80	Turf	Good	N/A
Rutland State	Rutland	1/19	5,000	100	Asphalt	Good	S-40, D-68
		13/31	3,170	75	Asphalt	Good	S-30
Shelburne	Shelburne	1/19	2,500	60	Turf	Good	N/A
Warren-Sugarbush	Warren	4/22	2,575	30	Asphalt	Good	S-8.5
William H. Morse State	Bennington	13	3,704	75	Asphalt	Fair	S-12.5

Source: Airport Facility Directory 2005, FAA 5010 Airport Master Record

AIRPORT NAVIGATIONAL AIDS AND LIGHTING

The existence of navigational aids (NAVAIDs) and lighting at system airports allows them to accommodate varying degrees of aviation activity during periods of reduced visibility and/or during inclement weather conditions. Various types of runway lighting, NAVAIDs, and approaches are available at the 17 airports included in Vermont's Airport System.

Table 2-3 depicts the availability of runway lighting, NAVAIDs, instrument approach capabilities, and visibility minimums at each airport. The data presented Table 2-3 identifies the types of NAVAIDs and lighting available at each system airport and the specific runway ends supported by each. Runway lighting at airports is classified as being low intensity runway lighting (LIRL), medium intensity runway lighting (MIRL), or high intensity runway lighting (HIRL) based on the types of lights used and their configuration.

Specific types of NAVAIDS currently available at system airports include:

- Precision approach path indicators (PAPI)
- Visual approach slope indicators (VASI)
- Runway end identifier lights (REIL)
- Medium intensity approach lighting system with runway alignment indicator lights (MALSR)
- Medium intensity approach lighting system with sequenced flashing lights (MALSF), and
- Omni-directional approach lighting system (ODALS).

PAPIs and VASIs provide visual references to pilots as they conduct approaches to a runway end. REILs identify the end of runway pavement and are an important visual reference to pilots during arrival or departure procedures. MALSR, MALSF, and ODALs are approach lighting systems (ALS) that provide additional visual reference to pilots typically while they are conducting instrument approaches to a runway.

The type of instrument approach available at each airport is also depicted in Table 2-3. Instrument approaches, categorized as precision or non-precision, provide electronic guidance to pilots to support their approach to an airport runway. Non-precision approaches provide electronic guidance to pilots that allow them to locate an airport and runway end. Precision approaches do the same while providing additional electronic glide slope data to a specific runway end.

Table 2-3
Airport Navigational Aids and Lighting

Airport Name	City	Runway	Lighting	NAVAIDS	Instrument Approach Type(s)	Lowest Visibility Minima 1/
Basin Harbor	Vergennes	2	None	None		
		12	None	None		
Burlington International	Burlington	1	MIRL	VASI	RNAV(GPS), VOR	426 – 1
		19	MIRL	PAPI		
		15	HIRL	MALSR	ILS, RNAV(GPS), NDB	250 – ¾
		33	HIRL	MASF, REIL, PAPI	ILS/DME, RNAV(GPS)	200 – ¾
Caledonia County State	Lyndonville	2	LIRL (NSTD)	REIL	NDB, GPS	555 – 1
		20	LIRL (NSTD)			
Edward F. Knapp State	Barre/Montpelier	5	None	None		
		23	None	None		
		17	MIRL	MALSR, PAPI	ILS	300 – 1 1/4
		35	MIRL	REIL	VOR/DME, VOR, GPS	843 – 1 1/4
Fair Haven Municipal	Fair Haven	2	None	None		
		20	None	None		
Franklin County State	Highgate	1	MIRL	REIL, VASI	RNAV(GPS)	632 – 1
		19	MIRL	REIL	RNAV(GPS), VOR/DME	612 – 1
Hartness State	Springfield	5	MIRL	REIL, VASI	RNAV(GPS), LOC/DME, Circling LOC, Circling NDB	965 – 1 1/2
		23	MIRL	None		
		11	MIRL	None		
		29	MIRL	None		
John H. Boylan State	Island Pond	14	None	None		
		32	None	None		
Middlebury State	Middlebury	1	None	None		
		19	None	None		
Morrisville-Stowe State	Morrisville	1	MIRL	REIL	Cirlcing NDB/GPS	1,268 – 1 1/2
		19	MIRL	REIL, VASI	GPS, Circling NDB/GPS	828 – 1 1/4
Mount Snow	West Dover	1	LIRL (NSTD)	None	NDB or GPS	1,567 – 3
		19	LIRL (NSTD)	None		
Newport State	Newport	5	None	None		
		23	None	None		
		18	MIRL	None	Circling NDB	550 – 1
		36	MIRL	REIL, PAPI	GPS, Circling NDB	514 – 1

Table 2-3
Airport Navigational Aids and Lighting, Continued

Airport Name	City	Runway	Lighting	NAVAIDS	Instrument Approach Type(s)	Lowest Visibility Minima 1/
Post Mills	Post Mills	4	None	None		
		22	None	None		
		5	None	None		
		23	None	None		
Rutland State	Rutland	1	MIRL	PVASI	VOR/DME	2,233 - 1 1/2
		19	MIRL	ODALS, REIL, VASI	RNAV(GPS), LOC Z, LOC/DME, VOR/DME	813 - 2
		13	MIRL	REIL, PAPI		
		31	MIRL	None		
Shelburne	Shelburne	1	None	None		
		19	None	None		
Warren-Sugarbush	Warren	4	None	REIL		
		22	None	REIL		
William H. Morse State	Bennington	13	MIRL	None	RNAV(GPS), VOR	1,062 - 1 1/2
		31	MIRL	REIL, VASI		

Source: Airport Facility Directory 2005, US Terminal Procedure 2005

The presence of a full instrument landing system (ILS), with glide scope and localizer, indicates a precision approach to the runway. The presence of only a localizer (LOC), a non-directional beacon (NDB), very high frequency omni-directional approach (VOR), or global positioning system approach (GPS), indicates a non-precision approach to the runway. The presence of none of these NAVAIDS indicates that an airport can accommodate visual approaches.

Burlington International and Edward F. Knapp State are the only airports in Vermont with precision approaches. Both ends of Runway 15/33 at Burlington International are supported by precision approaches. A precision approach supports Runway 17 at Edward F. Knapp State. Eight system airports, including Burlington International and Edward F. Knapp State, have non-precision approaches, and the remaining seven are supported by a visual approach.

AIRPORT LANDSIDE FACILITIES

Table 2-4 contains information on the availability of pilot and aircraft services such as a general aviation terminal, fuel, maintenance and repair, and air traffic control towers at system airports. In addition to providing the necessary facilities, it is important for system airports to have the types of services necessary to support the needs of their respective users. Currently, 12 system airports have a general aviation terminal, most offering a pilot's lounge, restroom, and telephone. Fuel is available at 13 of Vermont's system airports, seven of which offer both AvGas and jet fuel. Shelburne is the only airport to offer MoGas which is mostly used by smaller recreational or experimental aircraft. Airports or their tenants offer airframe and power plant repair and maintenance at 11 system airports. Burlington International is the only airport in the Vermont airport system with an air traffic control tower.

Table 2-4
Airport Landside Facilities

Airport Name	City	GA Terminal	Fuel	Aircraft Maintenance	Air Traffic Control Tower
Basin Harbor	Vergennes	No	100LL	No	No
Burlington International	Burlington	Yes	100LL, JetA	Airframe and Mechanic	Yes
Caledonia County State	Lyndonville	Yes	100LL	No	No
Edward F. Knapp State	Barre/Montpelier	Yes	100LL, JetA	Airframe and Mechanic	No
Fair Haven Municipal	Fair Haven	No	None	None	No
Franklin County State	Highgate	Yes	100LL	Airframe and Mechanic	No
Hartness State	Springfield	Yes	100LL, JetA	Airframe and Mechanic	No
John H. Boylan State	Island Pond	No	None	No	No
Middlebury State	Middlebury	Yes	100LL	Airframe and Mechanic	No
Morrisville-Stowe State	Morrisville	Yes	100LL, JetA	Airframe and Mechanic	No
Mount Snow	West Dover	No	None	No	No
Newport State	Newport	Yes	100LL, JetA	Airframe and Minor Mechanic	No
Post Mills	Post Mills	No	None	Minor Airframe and Minor Mechanic	No
Rutland State	Rutland	Yes	100LL, JetA	Airframe and Mechanic	No
Shelburne	Shelburne	Yes	MoGas	Airframe and Mechanic	No
Warren-Sugarbush	Warren	Yes	100LL	None	No
William H. Morse State	Bennington	Yes	100LL, JetA	Airframe and Mechanic	No

Source: Airport Facility Directory 2005

AVIATION ACTIVITY STATISTICS

The amount of aviation activity occurring at each Vermont airport impacts the types of facilities needed at each airport and is an important factor in determining the airport's role within the State system. An inventory of based aircraft at each airport is provided in **Table 2-5**. Vermont's 17 airports are the base of operations for 608 aircraft. Table 2-5 indicates that seven of the State's system airports have 50 or more based aircraft, Burlington International having the most with 91 based aircraft. Single-engine aircraft comprise almost 70 percent of the based aircraft in Vermont. Only three of Vermont's system airports have based jet aircraft, Burlington International, Middlebury State, and Rutland State.

Table 2-6 summarizes airport activity statistics as provided by each airport's most recent 5010 Airport Master Record. Table 2-6 shows aircraft operations by type. These recent operations statistics indicate that the State's system of airports accommodates approximately 328,000 aircraft operations on an annual basis. Approximately 12 percent of Vermont's aircraft operations are commercial (air carrier or commuter), while approximately 83 percent are classified as general aviation (air taxi or local/itinerant GA). Nearly five percent of operations are performed by military aircraft.

Table 2-5
Based Aircraft by Airport

Airport Name	City	Based Aircraft						
		Single Engine	Multi-Engine	Jet	Helicopter	Glider/ Ultralight	Military	Total
Basin Harbor	Vergennes	0	0	0	0	0	0	**0**
Burlington International	Burlington	48	9	5	1	0	28	**91**
Caledonia County State	Lyndonville	19	0	0	0	0	0	**19**
Edward F. Knapp State	Barre/Montpelier	55	5	0	0	0	0	**60**
Fair Haven Municipal	Fair Haven	2	0	0	0	0	0	**2**
Franklin County State	Highgate	46	1	0	1	5	0	**53**
Hartness State	Springfield	28	1	0	0	8	0	**37**
John H. Boylan State	Island Pond	0	0	0	0	1	0	**1**
Middlebury State	Middlebury	42	3	3	0	2	0	**50**
Morrisville-Stowe State	Morrisville	18	2	0	0	8	0	**28**
Mount Snow	West Dover	5	2	0	0	0	0	**7**
Newport State	Newport	15	2	0	0	0	0	**17**
Post Mills	Post Mills	20	0	0	0	9	0	**29**
Rutland State	Rutland	33	3	2	2	1	0	**41**
Shelburne	Shelburne	50	0	0	0	6	0	**56**
Warren-Sugarbush	Warren	20	0	0	0	50	0	**70**
William H. Morse State	Bennington	24	18	0	2	6	0	**50**

Source: FAA 5010 Airport Master Record

Table 2-6
Aircraft Operations

Airport Name	City	Aircraft operations						
		Air Carrier	Commuter	Air Taxi	GA Local	GA Itinerant	Military	Total
Basin Harbor	Vergennes	0	0	0	0	2,000	100	2,100
Burlington International	Burlington	5,761	31,855	0	26,067	27,245	12,171	103,099
Caledonia County State	Lyndonville	0	0	50	1,000	1,000	0	2,050
Edward F. Knapp State	Barre/Montpelier	0	0	1,000	17,000	13,000	1,000	32,000
Fair Haven Municipal	Fair Haven	0	0	0	250	150	0	400
Franklin County State	Highgate	0	0	100	17,000	2,800	1,500	21,400
Hartness State	Springfield	0	0	200	6,500	2,500	100	9,300
John H. Boylan State	Island Pond	0	0	0	50	150	0	200
Middlebury State	Middlebury	0	0	650	27,800	6,000	800	35,250
Morrisville-Stowe State	Morrisville	0	0	200	14,820	2,500	500	18,020
Mount Snow	West Dover	0	0	100	4,000	2,500	0	6,600
Newport State	Newport	0	0	0	5,500	1,460	180	7,140
Post Mills	Post Mills	0	0	10	8,000	1,500	0	9,510
Rutland State	Rutland	0	1,456	4,368	10,192	12,376	832	29,224
Shelburne	Shelburne	0	0	0	2,400	600	0	3,000
Warren-Sugarbush	Warren	0	0	0	19,000	3,500	0	22,500
William H. Morse State	Bennington	0	0	3,000	14,400	9,000	120	26,520

Source: FAA 5010 Airport Master Record

SUMMARY

The data presented in this chapter is used as the foundation for subsequent analyses of airport system performance. As noted in the previous sections, Vermont's aviation system has a wide variety of facilities, services, and activities. The need for facility enhancements, expansions, or system-level improvements is identified through a system analysis conducted in following chapters.